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# MANHATTAN BUILDING

Commission on Chicago Historical and Architectural Landmarks

(Barbara Crane, photographer)

MANHATTAN BUILDING
431 South Dearborn Street

William Le Baron Jenney, architect

Completed in 1891

The skyscraper of today was made possible by building techniques that were being tested in the early 1890s. These technological innovations advanced the development of a new style of commercial architecture which later came to be called the Chicago school style. The Manhattan building at 431 South Dearborn predates mature works of the school, but it contains all the elements used by Chicago school architects. The Manhattan was designed in 1889 by William Le Baron Jenney and completed two years later. Jenney utilized traditional methods and materials as well as new techniques with which he was then experimenting. The result was a building characterized by innovation and variety, a building technologically important to the development of modern architecture.

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Jenney was an engineer by training. He was born in Fairhaven, Massachusetts in 1832, and after his public school education he took courses in engineering at the Lawrence Scientific School. He then went to Europe to study architecture at the Ecole Centrale des Arts et Manufactures in Paris and graduated at the age of twenty-four. Returning to the United States, he served as an engineer in the Union army during the Civil War. After the war he came to Chicago, and here he established an architectural practice in 1868. In the following two decades, Jenney devised an innovative system of carrying the weight of a building on an internal framework of steel and iron. This system revolutionized building construction.

It has been suggested that Jenney first conceived the idea of steel framing on a visit to the Philippine Islands. There he saw how the Filipinos used a framing system of tree trunks to construct their houses. Jenney was probably aware of other simple frame structures: a cast-iron frame brick tower built by James Bogardus in 1855 for the McCullough Shot and Lead Company of New York; the grain elevator of the United States Warehousing Company in Brooklyn, New York designed by George H. Johnson in 1860; a frame warehouse on the St. Ouen docks in Paris built in 1864. Along with these precedents, Jenney may have been influenced by the writings of Frederick Baumann, a Chicago builder, who in 1884 published a pamphlet titled *Improvement in the Construction of Tall Buildings* in which he strongly recommended concealing iron framing within buildings. Whatever the exact inspiration for steel frame construction, Jenney first made use of these principles in the construction of a building designed for Chicago merchant Levi Leiter in 1879. Twelve years later, Jenney designed another building for Leiter, now the State Street Sears Roebuck and Company Store.

The first Leiter Building represented an intermediate step between the then prevalent masonry construction method and true steel frame construction. The building

**Projecting windows which provide the offices with netural light and air were one result of Jenney's experimental technology.**
(Barbara Crane, photographer)

**The design of the Manhattan strongly reflects Jenney's engineering background; the step-like profile represents an attempt to lessen the weight of the Manhattan on the adjacent buildings.**
(Barbara Crane, photographer)

stood at 200-08 West Monroe Street and was demolished in 1972. The first Leiter Building contained a relatively large amount of window area for a structure of that period and was said to be "very nearly a glass box." The building was supported partially by an internal iron structure and only partially by masonry walls. It was almost entirely devoid of ornament and as such was remarkable stylistically as well as structurally.

The possibilities of complete frame construction were further explored in Jenney's Home Insurance Building of 1884. It stood at the northeast corner of LaSalle and Adams until 1931 and was the first building in which the exterior was reduced to an envelope supported throughout by the internal framing. There were no masonry bearing walls, yet a portion of the total load was carried on the granite piers of the base and on the brick party wall, as required by the building codes at that time. These factors prevented the Home Insurance Building from being recognized as a true frame building, but the principle of steel framing was fully realized. Up until this time, the heavy bearing walls necessary to support tall buildings had restricted the heights of these buildings. The system of an internal framework provided a method which overcame this limitation, and the availability of the elevator starting in the 1860s added impetus to Jenney's discovery. Buildings could reach heights never before thought possible. Although the Home Insurance was only nine stories tall, it marked a radical transformation in the art of construction.

In the Manhattan Building Jenney's system of internal framing was fully implemented. The entire weight of the building was supported by the metal framework. The system provided the technical and eventually the aesthetic basis for modern architecture. Many Chicago school architects, such as Louis Sullivan, William Holabird, Martin Roche, and Daniel Burnham, began their careers in Jenney's offices. Jenney's technological accomplishments greatly influenced the designs of the young architects. They transformed steel framing from a matter of structure to a matter of style.

The Manhattan was a triumph of engineering. It rose to an unprecedented height of sixteen stories (matched by that of the north half of the Monadnock Building, a masonry structure completed the same year). Both its height and the limitations imposed on the building by its site prompted experimentation with structural techniques never before found necessary. The Manhattan was built between two existing eight-story buildings. (The building to the south was demolished when Congress Street was widened). The weight of the Manhattan transmitted to its footings was calculated at 3,000 pounds per square foot. Fearing that this great weight might weaken the foundations of the buildings on either side, Jenney developed a system to deal with this problem.

The Manhattan Building in nine bays wide. The seven center bays rise to sixteen stories, but the two end bays, sharing party walls with the buildings on either side, are only nine stories high, producing a step-like profile. The set-back created by this scheme withdraws the load of the side walls of the additional seven center stories to the row of heavy interior piers directly below. This set-back concept was further developed by Adler and Sullivan in the Schiller Building at 64 West Randolph Street. Adler claimed that the concept, in addition to eliminating excess load on the party walls, allowed for increased light and ventilation to the office spaces, thereby making them more desirable to prospective tenants. Jenney's foremost concern however was to protect the neighboring buildings. He took further precautions and supported the north and south walls of the building on cantilevers stretching from the interior framework.

**South Dearborn Street is lined with a variety of office buildings which illustrate different phases of the development of the Chicago school of architecture. The LaSalle Extension University separates Holabird and Roche's Old Colony *(left)* from Jenney's Manhattan *(right)*.**
(Barbara Crane, photographer)

Jenney's concern with the structural stability of the Manhattan led to another ingenious device. In order to prevent the facade of the building from cracking when the internal framework shifted and settled, Jenney attached the masonry units of the facade to the skeletal frame at each floor level by hangers. These are stirrup-shaped devices of metal attached to the horizontal members of the frame which then support the perpendicular pieces that attach the exterior to the frame. The device allowed the interior frame to shift and the facade to remain intact, undamaged.

Because the Manhattan was unusually tall, Jenney determined that the internal frame had to be bolstered against the force of the wind. With his structural engineer, Louis E. Ritter, Jenney developed a system of wind bracing using two different methods. The force of wind blowing against a tall building is transmitted to the basement level where tension is at a maximum. Here wrought-iron braces extending diagonally across the bays were employed to reinforce the columns. On the floors above, the deep girders were riveted to the columns in a simple system called portal bracing, effectively increasing the rigidity of the frame. The Manhattan was the first skeletal frame building in which these devices were deemed necessary, and their successful implementation furthered the development of skyscraper construction in which wind bracing is imperative.

The structural accomplishments of the Manhattan were accompanied by an attempt to produce a design related to functional considerations. With characteristic attention to practicality, Jenney designed a multifarious facade which has sometimes been criticized for its lack of coherence. But the design is simply a result of technological considerations. The Dearborn Street (west) facade is sheathed in grey granite up to the fifth floor, although cast-iron panels separate the shop front windows on the ground floor. Above the granite, pressed brick with terra-cotta ornament faces the building. The use of pressed brick on these upper stories represents an attempt to lighten the wall load of the building. This variety of materials produces the effect of a series of separate units stacked on top of one another. This look is emphasized by the prominent cornices found at the twelfth and sixteenth stories. The ornamentation (smiling and frowning faces, foliate motifs) is applied sparingly in an effort to avoid weighing down the design visually.

The most prominent feature of the facade is the diversity of window shapes. Although all the windows above the ground floor are double-hung, they vary greatly in size and arrangement. From the fifth through the eleventh story, the three center bays contain projecting trapezoidal windows. On either side of this group, from the fourth through the eighth stories only, the three bays of projecting windows are rounded. The remaining windows are all paired and are flush with the surface of the building. The organization of windows appears to lack coherence, yet the arrangement was intended to create more interior space above the public sidewalks and to capture as much light as possible for the offices not in direct line with a source of light. At the time of construction, Jenney was concerned that the two buildings under construction across the street (both now demolished), which were to be twelve and thirteen stories tall, would block the normal source of light. Consequently his design reflects a pragmatic attempt



**These photographs show two types of projecting windows which are found on the main facade of the Manhatten Building.**
(Barbara Crane, photographer)

to obtain natural lighting from the open area above the street by means of projecting windows. Bay windows were not necessary above the twelfth story where light reached the surface of the building directly, and hence the odd composition of flat and bay windows.

The east facade virtually repeats the design of the west but with less ornamentation. The north and south facades are simple and are faced with glazed tiles above the setback. The lively effect found in the design of the exterior was repeated in the interior public spaces. Mosaic patterns in marble covered the circulation area of the first floor. Polished marble and jasper wainscoting, as well as ornate bronze and copper fixtures and ornamental ceilings, further embellished the first floor. But now all of these decorative features have been either removed or covered with plaster. Five elevators located in the center of the building serve the office floors above. The elevators are run on a water-hydraulic system installed when the Manhattan was built. The elevator shafts and the staircases were originally enclosed with marvelous grillwork, but this has since been removed or covered over. However, the grillwork is still visible on the sixteenth floor.

Engineers and architects alike profited from the design of the Manhattan. The building is an important step in the history of building construction. Its modeled exterior facades reflect the lingering propensity for historically derived systems of design. At the same time the design composition expresses the needs of the building, in keeping with the "form follows function" axiom of the Chicago school. The vertical arrangement of the projecting central windows accents the height of the building. The window groupings also derive from practical considerations, and therefore reflect the spirit of the Chicago school. The technical innovations expressed in the Manhattan provided the backbone for further development of the Chicago school of architecture.

*(Cover photograph)*
**A view of the east side of South Dearborn Street showing the Manhattan Building c. 1892.**
(Courtesy of the Art Institute of Chicago)

*The Commission on Chicago Historical and Architectural Landmarks was established in 1968 by city ordinance, and was given the responsibility of recommending to the City Council that specific landmarks be preserved and protected by law. The ordinance states that the Commission, whose nine members are appointed by the Mayor, can recommend any area, building, structure, work of art, or other object that has sufficient historical, community, or aesthetic value. Once the City Council acts on the Commission's recommendation and designates a Chicago Landmark, the ordinance provides for the preservation, protection, enhancement, rehabilitation, and perpetuation of that landmark. The Commission assists by carefully reviewing all applications for building permits pertaining to designated Chicago Landmarks. This insures that any proposed alteration does not detract from those qualities that caused the landmark to be designated.*

*The Commission makes its recommendations to the City Council only after extensive study. As part of this study, the Commission's staff prepare detailed documentation on each potential landmark. This public information brochure is a synopsis of various research materials compiled as part of the designation procedure.*



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Printed U.S.A./June 1977